U. S.
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IN THE

Supreme Court of the United States

OCTOBER TERM, 1975.

No. 75-1744

E-T INDUSTRIES, INC.,

Petitioner,

vs.

WHITTAKER CORP. AND DES PLAINES GRAND AUTOMOTIVE SPEED CENTER, INC.,

Respondents.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

BRIEF FOR THE RESPONDENTS IN OPPOSITION.

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CONSTITUTIONAL PROVISION AND STATUTES INVOLVED.

1. Article 1 § 8, clause 8, United States Constitution which provides that Congress may enact laws:

> "To promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

2. Title 35 USC § 103 which provides:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in § 102 of this Title if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains."

STATEMENT.

Summary of the Case.

Petitioner, E-T Industries, Inc. (hereinafter called E-T) is the owner[1] of Beith Patent No. 3,329,468 and initiated suit on October 8, 1970 in the United States District Court for the Northern District of Illinois charging infringement of the patent. Defendants named in the original suit were Ansen Automotive Engineering, then a wholly owned subsidiary of Whittaker Corporation and Des Plaines Grand Automotive Speed Center Inc., a distributor. The original action was voluntarily dismissed with respect to Ansen Automotive Engineering, which company then filed a Declaratory Judgment Action in the United States District Court for the Northern District of California seeking a holding that the patent is invalid. The California case, on motion by Petitioner, was transferred to the Northern District of Illinois and consolidated with the original action for trial. Trial was held in April 1974, and the District Court, on October 31, 1974, handed down an opinion holding the patent valid and infringed and dismissing the claims for trademark infringement.

Respondents appealed the Trial Court's Decision to the United States Court of Appeals For The Seventh Circuit, which Court handed down an opinion on September 25, 1975, reversing the Trial Court and holding the "Beith patent was obvious within the meaning of 35 USC § 103 and, accordingly, the patent is invalid".[2] Petitioner then requested a rehearing *en banc*, which request was denied in an order dated March 11, 1976.

1. The statement on page 22 of Petitioner's memorandum that it purchased the patent for $1,375,000 is incorrect. The record is that Petitioner itself was purchased at that figure by F. D. I., Inc.

2. App. 8.

Summary of Facts Pertinent to This Petition.

While several independent affirmative defenses asserting both noninfringement and invalidity were presented to the Appellate Court for review, the Appellate Court principally considered the question of the obviousness of the Beith development under 35 USC § 103. The Appellate Court observed that while the District Court had reviewed the prior art in detail, "we need mention only two items, Adair[1] and Siler".[2] See App. 3.

The Beith patent in suit recognizes the well-known fact that automobiles use securing bolts or lugs fixed to brake drums and axles and that the diameters of the bolt circle or pattern in various cars of different manufacturers are not the same. The Beith patent suggests that a wheel may be adapted for fitting more than one bolt pattern by forming enlarged slots or openings. While this enables the openings to accommodate bolts arranged in different patterns, it also means that there will be excess space in the apertures around the bolts. The Beith specification further suggests that it is desirable "that the excess space in the lug apertures be eliminated in some manner. . . ." (Column 4, lines 55-57) and the drawings show several elements called washers or adapters which are either circular, oval, triangular or otherwise shaped for fitting into cut-out pockets or seats formed around the oversized holes.

The prior art Adair patent also relates to an automobile wheel provided with elongated openings or slots in a central mounting or hub portion so that it is adapted to be interchangably assembled on automobiles having bolt patterns of different diameters. In Adair, the securing nuts on several of the bolts simply bridge the slots or openings and engage opposite edges thereof in chamfered seats, but the excess space along the length of the slots remains. The record contains specimens of actual operative wheels made by Adair.

1. Adair Patent No. 2,590,363.
2. Siler Patent No. 3,006,343.

The Siler patent pertains to the fastening of parts together wherein an oversized aperture is deliberately designed in one part for receiving bolts in different positions. Adapters or washers fitting in recessed seats are provided for filling up the excess space.[1] In view of these documents, the Appellate Court found:

> "Each of the two essential parts of Beith's conception—first, enlarging the lug apertures to receive bolt arrangements of different radii; and second, effectively reducing the size of the enlarged openings to enable them to receive normal lug bolts—was unquestionably taught by the prior art. . . . in this case, the combination cannot be described as synergistic, and it seems rather clear that an artisan who conceived of the first step in his consideration of the problem of making an interchangable wheel would readily recognize the need for an adapter or an insert."

The Appellate Court then alluded to this Honorable Court's decision in the *United States* v. *Adams*, 383 U. S. 39 (1966), 86th S. Ct. 708, 15 L. Ed. 2d 572, and observed that there the decision of nonobviousness "rested heavily on evidence that long accepted factors would deter any investigation into the combination used by Adams." The Appellate Court then noted that the long accepted factors of the type in the *Adams* case are not found herein. To the contrary:

> "As the testimony of Plaintiff's own expert indicated, the problem was not so serious as to deter any investigation at all of enlarged lug apertures, but rather it was a problem typical of almost any new wheel design which would normally require careful testing and perhaps further experimentation and modification."

Beith alleged conception of his development in January, 1965, and the original patent application was filed in July, 1965. The documentary evidence and deposition testimony of an independent engineer named Ostgaard and others established that Ansen initiated a universal wheel development program

1. See page 5 of App. for drawing comparing Siler and Beith.

in 1964. During a period between May and November, 1964, Ostgaard produced drawings showing universal wheel structures having elongated slots or openings in mounting portions for accommodating different bolt diameters and also having seats for receiving washers or adapters which filled up the excess space. In addition, a similar prototype wheel known as the Fujii wheel was produced and placed on Dennis Fujii's car and driven about in his day to day business. While several deposition witnesses living in California positively identified the wheel as having been on Dennis Fujii's car prior to his entry into the Marines in March, 1965, and the wheel was further identified by live witnesses at the Trial, the District Court criticized the proofs pertaining to the exact time it was tested. However, the District Court did not deny the obvious existence of the wheel at about the time of the Beith development and the Appellate Court considered the wheel along with the Ostgaard drawings and held that these facts were consistent "with our own conclusion that the concept [Beith] was obvious".[1]

ARGUMENT.

There are no special and important reasons presented for granting the Petition. Nothing in the Court of Appeals decision is in conflict with the decision of another Court of Appeals or in conflict with applicable decisions of this Court. To the contrary, the Court of Appeals closely followed and acted in accordance with the mandates of this Court as expressed in *A & P Tea Co.* v. *Supermarket Equipment Corp.*, 340 U. S. 147, 95 L. Ed. 162; *Graham* v. *John Deere Co.*, 383 U. S. 1 (1966); *Anderson's-Black Rock Co. Inc.* v. *Pavement Salvage Company*, 396 U. S. 57 (1969); *United States* v. *Adams*, 383 U. S. 39 (1966) 86th S. Ct. 708, 15 L. Ed 2d 572 (1966); *Dann, Commissioner of Patents and Trademarks* v. *Johnson*, ____ U. S. ____; 47 L. Ed. 2d 692 (1976); and *Sakraida* v.

1. App. 7.

Ag Pro, Inc., ____ U. S. ____, 47 L. Ed. 2d 784; 189 USPQ 449 (1976). As required, the Court of Appeals scrutinized the Beith combination of old elements and found the patent invalid for obviousness.

This Case Presents No New or Unique Question Involving a Conflict of Decisions Between the Circuits or with This Court.

Contrary to Petitioner's assertions, there is no significant issue involved in this case as to the nature of the question of obviousness. There is and can be no factual dispute as to the existence of the prior art Adair and Siler patents which establish that each element of the Beith patent is old so that the Beith patent is simply directed to a combination of old elements. The patentability of such a combination of old elements has quite recently been considered by this Honorable Court in *Sakraida* v. *Ag Pro, Inc., supra,* in the decision handed down on April 20, 1976. There clearly is no compelling reason for this Honorable Court so soon to consider again similar issues.

In fact a review of the decision by the Court of Appeals reveals that it expressly recognized the concept that claims to a combination of old elements should be scrutinized "with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements", *A & P Tea Co.* v. *Supermarket Corp., supra; Anderson's-Black Rock* v. *Pavement Co., supra; Sakraida* v. *Ag Pro, Inc., supra.* As this Honorable Court did in the *Ag Pro, Inc.* case, *supra,* the Court of Appeals scrutinized the combination of old elements and held:

> "In this case the combination cannot be described as synergistic, and it seems rather clear that an artisan who conceived of the first step in his consideration of the problem of making an interchangable wheel would readily recognize the need for an adapter or an insert."

The decision by the Court of Appeals also shows that it adhered to the often stated rule that the test of patent validity or

obviousness is one of law, *A & P Tea Co.* v. *Supermarket Corp., supra; Graham* v. *John Deere Co., supra; Dann* v. *Johnson, supra.* As expressed in *Dann* v. *Johnson, supra,* decided shortly before *Ag Pro, Inc., supra,* factors outlined in *Graham, supra* should be considered and:

> "Guided by these factors, we [the Court] proceed to an inquiry into the obviousness of respondent's system."

In the same manner, the Court of Appeals in the case at bar recognized the requirements of *Graham, supra,* and proceeded to an inquiry into the obviousness of the Beith development and found the patent invalid.

The Court of Appeals Correctly Distinguished United States v. Adams.

While Petitioner asserts that the case at bar was incorrectly distinguished from *U. S.* v. *Adams, supra,* it is plain that Petitioner's arguments primarily refer to its contentions with respect to the evidence in the record rather than any purported important question of law arising from the Appellate Court's analysis of the *Adams* case.

Contrary to Petitioner's contentions, the Appellate Court properly recognized that the holding of nonobviousness in the *Adams* case "rested heavily on evidence that long accepted factors would deter any investigation into the combination used by Adams". The Appellate Court in reviewing the *Adams* case Decision quoted this Honorable Court which said:

> "Despite the fact that each of the elements of the Adams' battery was well known in the prior art, to combine them as did Adams required that a person reasonably skilled in the prior art must ignore that (1) batteries which continue to operate on an open circuit and which heated in normal use are not practical; and (2) water-activated batteries were successful only when combined with electrolights detrimental to the use of magnesium. These long

> accepted factors, when taken together, would, we believe, deter any investigation into such a combination as used by Adams."

The compelling circumstances of the *Adams* case are clearly distinguishable from those of the present case wherein Beith's alleged "brash" conduct simply involved removing additional metal to make elongated slots. Far from it being long accepted that such additional metal should not be removed, the Adair and Siler patents taught that elongated or enlarged openings could be provided around bolts when mounting wheels or other parts together. Furthermore, as the Appellate Court observed, Petitioner's own expert witness testified that it was simply an ordinary design problem when on cross-examination he admitted:

> "The strength of any structure depends on two things basically—what the material is that you are using, the quality of the material, and number two, on the geometry. Between these two variables, you can generally get about everything you need in structure."

In reinforcing its conclusion the Appellate Court referred to evidence in the record comprising the Ostgaard drawings and the Fujii wheel showing that the problem of removing metal would not deter work incorporating such a concept since Ansen had made such a development at about the time of Beith's conception. Petitioner complains that the Appellate Court thus engaged in wholesale retrying of the facts, but such is not the case. The Ostgaard drawings speak for themselves and there is no contrary finding by the District Court. Neither was there any finding of the District Court contrary to the Court of Appeals' observation that Ansen experimented with the Fujii wheel at about the time of Beith's development.

CONCLUSION.

Since there is no important question concerning an alleged conflict in the Decision of the Court below with the decisions of other Circuits or of this Honorable Court nor is there any other question of compelling public importance, it is respectfully requested that the Petition be denied.

Respectfully submitted,

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E-T INDUSTRIES, INC.,
Plaintiff-Defendant-Appellee,

v.

WHITTAKER CORP. and Des Plaines Grand Automotive Speed Center, Inc.,
Defendants-Plaintiffs-Appellants.

No. 74-1924.

United States Court of Appeals,
Seventh Circuit.

Argued Feb. 21, 1975.

Decided Sept. 25, 1975.

Rehearing and Rehearing En Banc Denied March 4, 1976.

In patent case involving competing manufacturers of "mag wheels," the United States District Court for the Northern District of Illinois, Eastern Division, Richard W. McLaren, J., entered judgment from which appeal was taken. The Court of Appeals, Stevens, Circuit Judge, held that subject matter of patent on automobile wheel that would fit different makes of cars was obvious, and accordingly the patent was invalid.

Reversed.

1. Patents ⇐324.55(3, 4)

District court's judgment on ultimate issue of validity of patent was entitled to special respect because of his better opportunity to have the exhibits explained to him by expert witnesses and by arguments of counsel, but obviousness question raised an issue of law on which the Court of Appeals had a responsibility to make an independent judgment.

2. Patents ⇐18

Subject matter of patent on automobile wheel that would fit different makes of cars was obvious, and accordingly the patent was invalid. 35 U.S.C.A. § 103.

Richard Bushnell, Chicago, Ill., for defendants-plaintiffs-appellants.

Irwin C. Alter, Chicago, Ill., for plaintiff-defendant-appellee.

Before CASTLE, Senior Circuit Judge, and SWYGERT and STEVENS, Circuit Judges.

STEVENS, Circuit Judge.

Were it not for the fact that the invention was a step in a direction opposite to what was considered good engineering practice, Beith's discovery of an automobile wheel that would fit different makes of cars would surely be considered obvious. The principal question presented by this appeal is whether the district court's findings that Beith ignored the risks that would have deterred others skilled in the art saves the patentability of an otherwise obvious conception.

1. It would appear, however, that the Pennsylvania regulation may not be enforced insofar as it predicates eligibility for medical assistance payments on conditions that were specifically invalidated in *Doe v. Bolton*, 410 U.S. 179, 93 S.Ct. 739, 35 L.Ed.2d 201 (1973), namely, a concurrence of two doctors and performance of the procedure in an accredited hospital.

I.

The parties are competing manufacturers of "mag wheels."[1] Mag wheels are specially designed wheels, usually cast aluminum and sometimes containing a magnesium alloy, intended to enhance the appearance of a car. They are more expensive than normal wheels. A buyer of such wheels, especially one who frequently changes cars, often wants to use the same wheels on successive cars. Car wheels, however, are not interchangeable because there has been no standardization among automobile manufacturers on the arrangement of the lugs which project from the brake drum or axle to secure the wheel. The lugs, of course, are arranged in a circle and usually there are five for each wheel. The most popular makes of cars, however, employ lug bolt circles of three different radii —4½ inches for Ford and Chrysler cars; 4¾ inches for Chevrolets; and 5 inches for the larger General Motors cars. The marketability of a mag wheel is significantly greater if it will fit all three of the most frequently used lug bolt arrangements than if it will fit only one.[2] The purpose of Beith's invention was to make a wheel that would fit lug bolt circles of different radii.

Beith's solution to the problem was simple. He elongated the lug apertures in the wheel sufficiently to accommodate lug bolts arranged in circles of different radii; he then inserted adapters to fit snugly into the enlarged lug apertures; each adapter, in turn, contained a hole through which the lug projected. One set of adapters contained off-center holes. If such an adapter was turned in one direction, the opening would be 4½ inches from the axle; reversed, the radius would be 5 inches. In a second set of adapters a central hole would accommodate a radius of 4¾ inches.

The patent describes various shapes of lug openings and adapters to fit them. The basic idea, however, was simply an enlarged lug opening to be fitted snugly with one or more inserted adapters, the position of which would determine the lug circle radius which the wheel would fit.

Beith conceived his invention in January of 1965. At that time he was running a small company manufacturing custom wheels with three different predrilled bolt patterns.[3] He took one of those wheels and enlarged the lug aperture by drilling all three standard lug patterns into it and then experimented with cardboard inserts to make sure that the wheel would fit all three sizes.

He requested the foundry which was casting wheels for his company to sandcast the new wheel for him with the enlarged lug openings. Beith testified that executives of the foundry expressed concern about their ability to sandcast the holes accurately and about the possibility that the wheel would be weakened by the elimination of additional metal, which in turn might subject the company to product liability problems. A second foundry, which used a permanent mold process rather than sandcasting, agreed to make wheels for Beith. That company insisted, however, that Beith make better drawings and recommended an engineer to review the project.

1. Plaintiff E-T Industries is a wholly-owned subsidiary of Filter Dynamics International, Inc., which purchased E-T's stock from the inventor Beith in 1970. Ansen Automotive Industries was at the time of the trial a wholly-owned subsidiary of Whittaker Corporation. After trial Ansen was merged into Whittaker, which was then substituted as a defendant. Defendant Des Plaines Grand Automotive Speed Center, Inc., is a distributor of Ansen's wheels.

2. Because of the high cost of custom wheels, the variety which a dealer could carry in inventory was limited. Thus, a wheel which could be used interchangeably on all three sized lug patterns provided the dealer, as well as the customer, with significant economies.

3. Beith graduated from college in 1958, taught school for about five years, and apparently formed his wheel company about a year or two before he conceived the patented invention.

Beith discussed the problem of weakening the wheel by enlarging the lug apertures, but the engineer "felt that it could be accomplished, or at least we could certainly experiment; the only way we would really know was to go ahead and make the drawings, have molds made, cast some wheels and really, because there was no testing at that time, market the product and find out the real test, the real proof. It was all conjective at that point as to whether the product would function out on the highway, on the automobiles, in the marketplace." Tr. 77.

Beith filed his original patent application in July. In October, 1965, he tested the new wheel in operation, found that it worked, and began to sell it commercially. Sales increased dramatically. Plaintiff had commenced operation on an investment of $750; in 1970, Beith sold the company to Filter Dynamics for FDI stock valued at $1,375,000. Thereafter, annual sales grew from about $2,500,000 to almost $13,000,000 in three years.

At about the same time that Beith developed the patented wheel, several employees of defendant Ansen were experimenting with the "Fujii wheel"—so named because it was placed on the 1951 Chevrolet which an Ansen employee named Dennis Fujii drove to work every day. The Fujii wheel was a standard wheel on which the lug apertures were enlarged to hold an insert which enabled the wheel to fit the 4¾ inch lug circle. The insert used in the Fujii wheel would fit only a Chevrolet, but it is apparent that the Fujii concept, just like Beith's, would be equally useful with different inserts for different sizes.[4] Defendant adduced oral testimony to prove that the Fujii wheel was in public use more than a year before Beith filed his patent application. The district court found this evidence of doubtful reliability.[5] Moreover, he noted that Ansen did not proceed with the development of an interchangeable wheel employing the Fujii concept, but instead developed an entirely different wheel embodying a so-called "knock-off lug" modeled after wheels used on racing cars.

Later, after acquiring Ansen, defendant investigated the Beith patent and started to manufacture and sell wheels which the district court found to infringe.

The district court reviewed the prior art in detail. We need mention only two items, Adair[6] and Siler.[7]

Adair disclosed a wheel which will fit lug circles not only of different diameters but also containing different numbers of lugs. Like Beith, it had elongated lug apertures to accommodate different sizes, but it also had extra openings, some of double width, to make it possible to fit six as well as five lugs with the same wheel.[8] Adair merely disclosed the idea—which we think would be obvious even without Adair—that enlarged lug apertures would enable a wheel to fit lug circles of different diameters.

4. The insert used in the Fujii wheel contained an off-center hole to receive lug bolts from a Chevrolet. Since the lug circle radius on a Chevrolet is 4¾ inches, reversal of that insert would accommodate a radius of 5¼ inches. No American car uses that lug arrangement and, therefore, as the district court found, the actual Fujii wheel fit only one sized car. The district court also noted doubt as to whether the insert actually used with the Fujii wheel could have been reversed. It seems quite clear, however, that the invention described in the patent would cover a wheel which used three different inserts to fit the three wheel sizes, as well as one which uses two inserts, one containing a concentric hole and the other containing an eccentric hole useful in two positions to accommodate three sizes.

5. The evidence established that Ansen initiated a wheel development program in 1964. An independent engineer named Ostgaard prepared a number of design drawings for Ansen during the period between May and November, 1964. Since he was not told about the Fujii wheel, it seems likely that that wheel was made later. On the other hand, one of Ostgaard's early pencilled drawings originally depicted enlarged lug apertures which were erased when a design change was made.

6. Adair Patent No. 2,590,363; issued on March 25, 1952, covering "wheel adaptable to different hubs."

7. Siler Patent No. 3,006,443, issued October 31, 1961, covering "Method and Apertures for Attaching Juxtaposed Members."

APP. 3

The Siler invention did not relate to wheels. It was concerned with the problem of securely attaching two parts, such as metal plates or sheets, which contain holes that are somewhat misaligned, and therefore will not accommodate a fastener such as a rivet or a bolt of the same size as the holes. The patent teaches that it is undesirable simply to enlarge the hole in one of the two plates and then to use a rivet or bolt of the same size as the original hole.[9] Instead, the patent teaches the use of adapters containing small off-center holes which can be aligned with one another, and through which a smaller bolt or pin can be inserted to fasten the members together.

The Siler patent is relevant to the Beith invention in two different ways. On the one hand, its admonition not to enlarge bolt holes unnecessarily supports the district court's findings that Beith's conception, insofar as it enlarged the lug apertures in the web of the wheel, was contrary to accepted engineering practice.[10] On the other hand, Siler also taught that an adapter, or insert, could be used to secure a relatively small bolt

8. Adair's basic idea was to have a universal emergency wheel which could be substituted for a damaged wheel on almost any vehicle in order that the vehicle could be driven instead of towed to a repair facility.

9. The Siler specifications state, in part:

"Frequently, the mechanic working with supposedly exact and interchangeable parts finds some members deviating so far from the desired standard that they cannot be bolted or riveted or otherwise properly fixed together. Thereupon, he frequently resorts to an undesirable expedient which will forever thereafter preclude the replacement and integration into the device (as when undergoing repairs) of a truly standardized part or parts.

"In such undesirable practice, the mechanic proceeds to drill new holes by hand, or ream and enlarge the misaligned holes, so that they will receive bolts or other fastening elements.

"Such expediency and ill considered practice will produce a weakened structure because it has been provided with irregular or enlarged holes greatly exceeding the limits of tolerance allowed by the designing engineers and/or failing to meet the requirements of standards in strength and stability."

10. The relevant findings are Nos. 9 and 34, which read as follows:

"9. The approach Beith decided to take was opposite to what was considered good engineering practice,[9] because the part of the wheel where the elongated slots were to be formed was structurally the weakest part of the wheel. Much concern had been shown for the strength of wheels in this critical area. His solution to the long-existing problem was an unexpected and unobvious acceptable solution since people with ordinary skill would have sought an acceptable solution by using large adapter plates."

"34. The level of ordinary skill in the automotive wheel field is such that those skilled in the art would not have gone in the direction that Beith went at the time of his invention.[9] Beith removed material from what is considered a critical portion of the wheel—the central mounting portion or web near the central hub opening. Thus, Beith went in a direction opposite to the direction that was being taken by those having ordinary skill in the art. By doing so, the public was provided with a universal wheel that was smart looking, in that the elongated slots were directly in the web of the wheel itself and small adapter means were used to obtain universality. Such wheels could be manufactured and operated easily while still having a pleasing appearance as well as reliably locating and attaching the wheel to the brake drum.

[9] *Cf.* U.S. Letters Patent No. 3,006,443 (Siler) at column 1, lines 50–60.

"[9] This is brought home by the fact that Ansen rejected the idea of elongated apertures and opted for a plate system at around the same time as Beith was developing his wheel."

The footnotes are the court's.

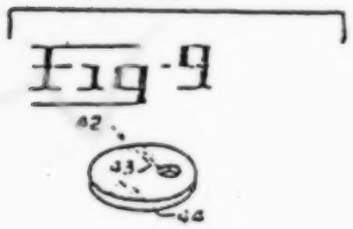
APP. 4

in a large opening.[11] Thus, if we consider the two parts of the Beith invention separately, in effect Siler taught (a) that the lug apertures should not be enlarged, but (b) if they should be enlarged, the oversized openings could nevertheless be secured to a normal lug by using an adapter, or insert, containing a smaller hole fitting the lug bolt.

The district court's findings that Beith's invention took a step in a direction opposed to the teaching in the prior art are supported, not only by Siler[12] and by Beith's testimony describing the first foundry's objection to sand-casting a wheel with larger openings in the web, but also by plaintiff's expert Nass, who testified that enlarging the holes to accept different lug patterns would be considered "a pretty brash move" likely to produce "some kind of trouble."[13] He further explained that to

11. The adapter, or insert (44) in Fig. 9 of Beith's patent (shown below on the left) is similar to the adapter, or insert (15) in Figs. I and IV of the Siler patent (shown on the right).

[Beith]



[Siler]

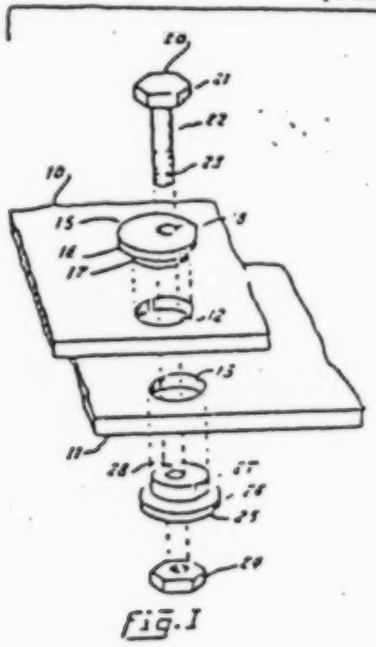


fig. I

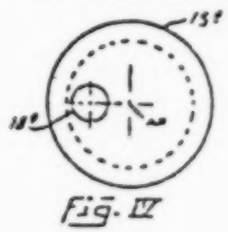


fig. IV

12. Actually, the portion of the Siler specifications on which the district court relied is a comment on the undesirability of enlarging a hole in a prefabricated part, rather than a comment on the possible consequences of designing an entirely new product containing larger holes than those found in a previous design.

13. He testified at Tr. 299-301:

"Q In your opinion would it be good design to remove the amount of material that has been removed there as opposed to just a small circle as a pre-drilled wheel had?

"No. If I might state your question the way I understand it, we assume we start with a wheel that merely has drilled holes in it in normal application. Now we consider enlarging the holes to accept the UNI LUG system.

"Q Yes, sir. Right.

"A Well, in my opinion that would be a pretty brash move because it is in an area where the stress level is quite high. From the tests I have run, you would be, so to speak, asking for trouble by making a move of this kind.

"Q Would you say that that would be going in the opposite way of good wheel design?

"A I believe logically it would be going in the wrong direction, yes.

"Q Based on that opinion, do you think it would have been expected for some one to go in that direction to reach the result obtained with the UNI-LUG system?

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"My feeling in the matter is that a person, if he appreciated what was going on stress-wise in a wheel, he would soon realize that making a move of this kind, he would probably get into some kind of trouble."

determine whether a change like that would be acceptable, it would be necessary to make several tests, and then added:

> Well, I can state that by my experience, that is the typical way that alterations and modifications to wheels are made. Frequently there is very little what you might call rigorous analysis involved in it. They will make a modification and then the wheels will be sent down to me for an evaluation and certain road levels are applied to the wheels, and sometimes the wheels are what is known as stress coated to study the stress pattern in the wheel to gain a knowledge of what is going on in the wheel, and then from that knowledge further changes may be made. There could be an alloy section change made. There could be a section thickness change made or some other changes made to get the wheel up to a point where it would be satisfactory again structurally.

Tr. 301-302. On cross-examination he testified that if a wheel or any other structure is weakened by removing material, the weakness could be counteracted by adding or repositioning other material. For example, he said:

> The strength of any structure depends on two things, basically—what the material is that you are using, the quality of the material, and No. 2, on the geometry. Between those two variables you can generally get about everything you need in structure. Tr. 411.

II.

[1] There is no basis for criticizing the district court's analysis of this invention. He followed the procedure mandated by *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545, his findings evidence a thorough understanding of the invention and the prior art, and his judgment on the ultimate issue of validity is entitled to special respect because of his better opportunity to have the exhibits explained to him by expert witnesses and by the arguments of counsel. Nevertheless, the obviousness question raises an issue of law on which we have a responsibility to make an independent judgment. In this case that judgment involves a three-step consideration: first, whether each element of the invention is obvious; second, if so, whether the combination is obvious; and third, if the combination seems obvious in itself, whether the rejection of the contrary teaching in the prior art requires a different conclusion.

Each of the two essential parts of Beith's conception—first, enlarging the lug apertures to receive bolt arrangements of different radii; and second, effectively reducing the size of the enlarged openings to enable them to receive normal lug bolts—was unquestionably taught by the prior art. The combination, however, was new. It would therefore be patentable if it produced a result other than the anticipated sum of the separate parts, or if a person skilled in the art, fully aware of the separate elements of Beith's concept, would not be expected to combine them when looking for the solution to the problem of making an interchangeable wheel. In this case, the combination cannot be described as synergistic, and it seems rather clear that an artisan who conceived of the first step in his consideration of the problem of making an interchangeable wheel would readily recognize the need for an adapter or an insert.[14] We are persuaded that the ultimate conclusion of non-obviousness can only be supported

14. No particular importance is attached to the reversible character of the insert containing the eccentric hole because the patent would equally cover the use of three or more separate inserts, none of which was reversible.

by the district court's reliance on the adverse teaching in the prior art.[15]

In *United States v. Adams*, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572, the Court's conclusion that the discovery of a water activated battery, using magnesium cuprous chloride electrodes, was nonobvious rested heavily on evidence that long accepted factors would deter any investigation into the combination used by Adams.[16] The reasoning of the *Adams* case is not applicable to Beith's invention.

The Adams battery generated large quantities of heat during normal operation and the prior art taught that such a battery was not practicable. Moreover, the prior art also taught that water activated batteries were only successful when used with electrolytes harmful to magnesium. The court was persuaded that both of these long-accepted factors would deter *any investigation* of the combination which Adams found to be unexpectedly successful.

In this case, the contrary factor was merely the rather obvious notion that enlarging holes in a structural member will weaken it to some extent. But the record establishes that it was equally clear that some enlargement might be tolerated and that modifications in design or material strength might overcome the effect of the loss of some material. As the testimony of plaintiff's own expert indicates, the problem was not so serious as to deter any investigation at all of enlarged lug apertures, but rather it was a problem typical of almost any new wheel design which would normally require careful testing and perhaps further experimentation and modification.

The prior art taught that interchangeability might be achieved by using enlarged lug apertures, but that any such new design should be carefully tested to be sure it was safe. This prior art warning to be careful with the new design is not, in our judgment, equivalent to the uniform prior art teaching in *Adams* that any investigation of the use of the magnesium electrode in a water activated battery would be purposeless.

We have also considered the relevance of the Fujii wheel. The fact that Ansen also experimented with enlarged lug openings and inserts is consistent with our conclusion that the concept was obvious, whereas the fact that Ansen did not go forward with the development of this kind of wheel until after Beith had demonstrated its feasibility tends to undermine that conclusion. It does not, however, support the applicability of the *Adams* rationale to this case because there is no evidence that Ansen's decision not to go forward with the Fujii wheel rested on any concern about weakness caused by enlarging the lug openings. On the contrary, the fact that the Fujii wheel was in fact made and actually tested indicates that the prior art did not completely deter any experimentation with this concept.

[2] We conclude that the subject matter of the Beith patent was obvious within the meaning of 35 U.S.C. § 103 and, accordingly, that the patent is invalid.

Reversed.

15. We do not ignore the substantial evidence of commercial success which buttresses the district court's conclusion of validity, but such success is not by itself sufficient to show nonobviousness. Rather, it must be weighed with all the other evidence in the record.

Novo Industrial Corporation v. Standard Screw Company, 374 F.2d 824 (7th Cir. 1967); *Application of Cline*, 345 F.2d 847, 52 CCPA 1404 (1965).

16. "We conclude the Adams battery was also nonobvious. As we have seen, the operating characteristics of the Adams battery have been shown to have been unexpected and to have far surpassed then-existing wet batteries. Despite the fact that each of the elements of the Adams battery was well known in the prior art, to combine them as did Adams required that a person reasonably skilled in the prior are must ignore that (1) batteries which continued to operate on an open circuit and which heated in normal use were not practical; and (2) water-activated batteries were successful only when combined with electrolytes detrimental to the use of magnesium. These long-accepted factors, when taken together, would, we believe, deter any investigation into such a combination as is used by Adams. This is not to say that one who merely finds new uses for old inventions by shutting his eyes to their prior disadvantages thereby discovers a patentable innovation. We do say, however, that known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness.

"Nor are these the only factors bearing on the question of obviousness. We have seen that at the time Adams perfected his invention noted experts expressed disbelief in it. • • • Furthermore, in a crowded art replete with a century and a half of advancement, the Patent Office found not one reference to cite against the Adams application." 383 U.S. at 51-52, 86 S.Ct. at 715.